

# **INFINITELY VARIABLE, ORDER SPECIFIC, HOLISTIC ASSEMBLY PROCESS CONTROL SYSTEM**

## **Abstract of the Disclosure**

Interfaces are provided which integrate mistake-proofing concepts in a way easily understandable by the operator and easily configured by a manufacturing engineer. As mistake-proofing concepts are developed tables are populated and associated with specific assembly processes. Sensors are employed to monitor parts selection and tool usage. Sensors used for tool use and parts selection, error messages and actions to be performed or monitored are all defined and related in the tables and in turn to specific assembly orders. The tables are also populated with logic pointers, which are referenced by a Process Logic Control (PLC) unit that has been programmed to recall and carry out infinitely variable monitoring or control of the assembly process. For example when a particular order has been identified to the PLC by way of a scanned barcode or other means, a bill of material and assembly sequence is provided to the operator by appropriate means such as a CRT monitor. Parts bins and assembly points may be indicated by visual or other means to indicate parts and tools to be used and assembly points. Sensors determine when the proper part has been selected for the particular assembly step and/or whether the appropriate tool is used. The PLC then provides feedback to the operator to indicate whether all necessary steps have been accomplished in the proper order, with the proper parts using the proper tools. The PLC will provide the operator with understandable error messages indicating when a step has been improperly completed. The PLC can also control stops on the line to prevent the assembly from moving forward until all steps have been completed according to the specific order program. An override means may also be provided to bypass the PLC controls in which case an error log is compiled and an automated message is sent to supervisory personnel indicating that the system was overridden by the operator and follow up action is required.